

Gears for instruments and clockwork mechanisms —

Part 2: Cycloidal type gears

UDC 621.833:681 – 2

Confirmed
January 2011

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The Government departments and the industrial organization marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this standard:—

Association of Mining Electrical and Mechanical Engineers	National Association of Lift Makers
British Clock and Watch Manufacturers’ Association	National Federation of Engineers’ Tool Manufacturers
British Gear Manufacturers’ Association	National Physical Laboratory
British Horological Institute	North East Coast Institution of Engineers and Shipbuilders
Institution of Engineering Inspection	Society of Motor Manufacturers and Traders Ltd.
Manufacturers of Instrument Gears	
Milling Cutter and Reamer Trade Association	
National Association of Drop Forgers and Stampers	

This British Standard, having been approved by the Mechanical Engineering Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 24 January 1952

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First published in October 1941
First revision January 1952

Amendments issued since publication

Amd. No.	Date of issue	Comments
2407	March 1956	
4569	May 1962	Indicated by a sideline in the margin

ISBN 0 580 34084 8

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Foreword

This standard makes reference to the following British Standards:—

BS 978-1, *Involute spur, helical and crossed helical gears*.

BS 2519, *Glossary of terms and notation for gearing*.

This British Standard supersedes BS 978, “*Gears for clockwork mechanisms*”, which was published in 1941 as a war emergency measure to assist in the reduction of types and sizes of both gears and cutters.

As a result of experience gained in its use it became evident that a revision was necessary and it was considered desirable to divide the standard into four separate parts as follows:—

- *Part 1: Involute spur, helical and crossed helical gears*;
- *Part 2: Cycloidal type spur gears*;
- *Part 3: Bevel gears*;
- *Part 4: Worm gears*.

Part 4 will be published as it becomes available.

Suitable hobs and cutters will be dealt with in a later British Standard.

The provisions of this part differ substantially from those of the original BS 978, as a cycloidal type of gear has been substituted for the circular arc form. The standards of the Swiss and Black Forest watch and clock industries, particularly the former, have been used as a basis; this was considered desirable because of the prevalent use of those standards for horological work and other applications where a cycloidal form is preferred.

An explanation of this type of gearing, as applied to wheels driving pinions, is included in Appendix A.

Arising out of discussions which have taken place in connection with the work undertaken by the International Organization for Standardization on gears, there are indications that it may be possible to simplify the provisions of the standard in regard to tooth form and proportions. It is intended to give further attention to this subject when more evidence is available.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1 Scope

This part applies to cycloidal type spur gears for spring or weight-driven mechanisms in which:

- the pinion is the driven member, or
- the pinion is required to act sometimes as the driver and sometimes as the driven member.

For integrating electricity meters the particular form of gear specified herein is not necessary and it is recognised that other existing forms of gear will continue to be used.

2 Terminology and notation

The terms and notation shall be as defined in BS 2519 "Glossary of terms and notation for gearing." For the convenience of users of the standard, an abbreviated list of symbols is given in Appendix B.

3 Range of standard modules

The standard modules shall be as set out in Table 1, preferred sizes being shown in bold type.

Table 1 — Range of modules

(dimensions in millimetres)

Modules		
0.070	0.150	0.320
0.072 5	0.155	0.340
0.075	0.160	0.360
0.077 5	0.165	0.380
0.080	0.170	0.400
0.082 5	0.175	0.420
0.085	0.180	0.440
0.087 5	0.185	0.460
0.090	0.190	0.480
0.092 5	0.195	0.500
0.095	0.200	0.550
0.097 5	0.210	0.600
0.100	0.220	0.650
0.105	0.230	0.700
0.110	0.240	0.750
0.115	0.250	0.800
0.120	0.260	0.850
0.125	0.270	0.900
0.130	0.280	0.950
0.135	0.290	1.000
0.140	0.300	
0.145		

Section 2. Tooth form and proportions

4 Wheels driving pinions

a) *General.* The teeth of wheels driving pinions designed in accordance with Clause 5 shall have the proportions given in Table 2 and Figure 1.

Values for f and f_r , appropriate to the gear ratio and the number of teeth in the pinion, shall be obtained from Table 3, or Chart 1 and Chart 2.

The addendum height and the radius of curvature of the addendum shall be in accordance with Table 2. The centre of curvature for the addendum curve shall be chosen so that the curve and the centre line of the tooth intersect on the addendum circle; the radial flank is tangential to this curve (see Figure 2). The bottom of the tooth spaces shall be approximately semi-circular (see Figure 1).

Wheels designed in accordance with the provisions of this clause are only suitable to drive pinions designed in accordance with Clause 5.

Table 2 — Proportions of driving wheels

Tooth thickness along pitch circle	$1.57 m$
Addendum A	$f m$
Dedendum B	$1.57 m$
Radius of curvature of addendum r_A	$m f_r$
Pitch diameter	D
Outside diameter	D_a
Root diameter	D_r
	$D + 2 f m$
	$D - 3.14 m$

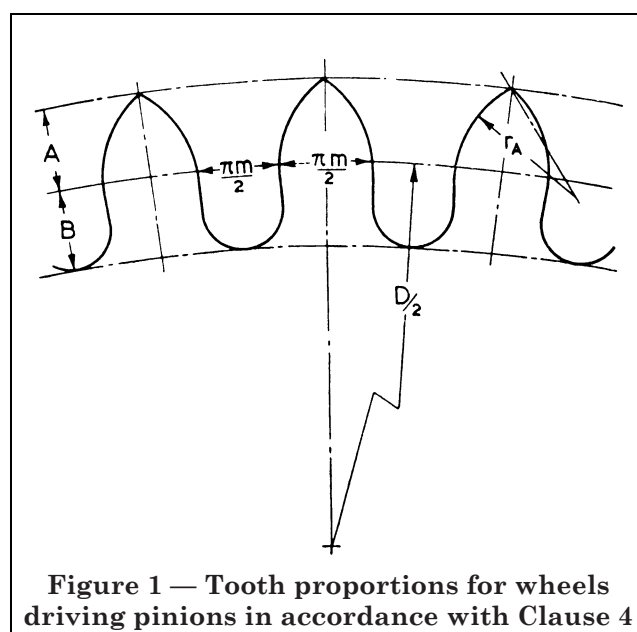


Figure 1 — Tooth proportions for wheels driving pinions in accordance with Clause 4